

REMARKS

This is in response to an office action dated 12/02/97. Claims 34 and 43-50 are pending in the case, and are rejected.

Claims 34 and 43-50 are rejected under 35 USC §112, second paragraph, as being indefinite. The examiner suggests that:

"adjusting the orientation of the substrate does not planarize the tips of probe elements. The tips will remain in a single plane regardless of which angles they all lie. Further, a planarizing step seems to refer to something being cut."

The preamble of **Claim 34** has been amended to recite "altering the orientation" rather than "planarizing".

Claims 34, 43-46 and 50 are rejected under 35 USC §103 as being unpatentable over Bargain et al (US 5,437,556) in view of Tsuji et al (US 5,017,738).

Bargain discloses a **connector** for mounting on a printed circuit card 12 and for making connections to a substrate 14 for active electronic circuits 16. The connector comprises an insulating support 20 and a plurality of contacts 22 located in passages in the insulating support 20. "Means for forcing the substrate 14 against the support 20 comprise[s] a movable assembly having a pressure plate 64 and screws 66." (column 3, lines 34-36) In this manner "a contact force is thus guaranteed both on the substrate [14] and on the printed circuit [12]" (column 3, lines 48-50).

The present invention discloses (and claims) a **probe card assembly** (and, of course, a **method of orienting** probe elements of a probe card assembly), an example of which can best be viewed in Figure 5, which generally comprises:

a support substrate 506 having a plurality of probe elements 524 on a surface thereof;

a probe card; and

means for altering the orientation of the support substrate relative to the probe card, hence altering the orientation of the probe elements, without altering the orientation of the probe card.

It appears that the examiner is equating the following elements of the present invention with the following elements of Bargain:

- Applicant's substrate 506 with Bargain's substrate 14; and
- Applicant's card 502 with Bargain's card 12.

From whence, it appears that the examiner appears to take the position that Bargain can alter the orientation of his substrate 14 in a manner which is analogous to the applicant altering the orientation of his substrate 506.

This reasoning fails.

Bargain shows a mechanism (64,66) for clamping his substrate 14 against his card 12, to ensure that "a contact force is ... guaranteed" (column 3, lines 48-50).

Bargain does not contemplate, teach or suggest altering the orientation of his substrate 14.

Moreover, Bargain has nothing to do with probing semiconductor devices. (compare the preamble of **claim 34**, as amended herewith). Rather, Bargain discloses a relatively permanent connector fixture for securing a substrate (14) carrying a semiconductor device (16) to a printed circuit board (12).

Tsuji et al discloses a printed circuit board substrate 12 having pads 20. A coil spring 16 is provided on the pad 20 and is

Amendment of April 23, 1998

accommodated within a cylindrical capsule 22 and can be expanded or compressed in the longitudinal direction of the capsule. (see paragraph bridging columns 3 and 4). Tsuji is cited in combination with Bargain et al in support of the proposition that it would have been obvious to replace the circuit element of Bargain et al with the probing elements of Tsuji et al.

It is well known that connecting devices 16/22 such as are shown in Tsuji are not suitable for probing semiconductor devices.

A patent examiner bears the burden of establishing a prima facie case of obviousness when rejecting claims under 35 USC §103. The mere fact that the references cited by the examiner may be modified does not allow the examiner to meet his or her burden absent a suggestion in the cited art of the desirability of the modification. Moreover, the examiner may not "use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." In re Fritch, 23 USPQ 2d 1780 (Fed. Cir. 1992).

Tsuji, for example, does not suggest that the orientation of its substrate 12 is critical, or needs to be altered.

More importantly, however, Tsuji is utterly irrelevant in that it does not teach probe elements suitable for probing (making contact with) semiconductor devices, or electronic components on the scale of semiconductor devices.

In marked contrast to Tsuji, as clearly stated in the specification of the present invention (page 1, lines 4-9):

" The invention relates to making temporary, pressure connections between electronic components and, more particularly, to techniques for performing test and burn-

in procedures on **semiconductor devices** prior to their packaging, preferably prior to the individual semiconductor devices being singulated from a semiconductor wafer." (emphasis added)

The "microscopic" scale required of probe elements for probing semiconductor devices (or dies) is evident. As noted in the specification (page 2, lines 25-29):

" Certain difficulties are inherent in any technique for probing semiconductor dies. For example, modern integrated circuits include many thousands of transistor elements requiring many hundreds of bond pads disposed in close proximity to one another (e.g., **5 mils center-to-center**). " (Emphasis added)

With these factors in mind, the preamble of **Claim 34** is amended herewith to distinguish over the cited art, particularly Tsuji which, as noted above, does not provide a probe element suitable for probing semiconductor devices.

Moreover, there is no suggestion in Tsuji of changing orientation of his contacts other than by pressing against a second electrical device. There is no suggestion at all of orienting the support structure relative to anything. Even if the Tsuji structure was clamped as in Bargain, this would not alter the orientation of the probe elements by altering the orientation of the substrate, but rather by compression against a reference surface. Such a mechanism is entirely different than that of the present invention. The point of the present invention is to orient the probe elements precisely before contacting a reference surface such as a semiconductor wafer.

Claims 47-49 are rejected under 35 USC §103 as being unpatentable over Bargain et al (US 5,437,556) in view of Tsuji et al (US 5,017,738), and further in view of Kwon et al (US

5,187,020).

Claim 47 has been amended to more clearly claim the present invention. These claims, as amended, are distinct from the references. In addition, each of claims 47-49 are dependent on claim 34. As discussed above, claim 34 is readily distinguished from the prior art. Applicants respectfully submit that inasmuch as claim 34 is allowable over the cited art, so too are claims dependent on claim 34. Applicants request the Examiner withdraw this rejection and allow claims 47-49. "

Newly-Presented claims

Newly-presented dependent **claim 51** is somewhat similar to **claim 43**, as filed.

Newly-presented dependent **claim 52** is supported, for example, by the description of Figure 5.

Newly-presented dependent **claim 53** is supported, for example, in the specification at page 8, lines 2-4.

Newly-presented independent **claim 54** is somewhat similar to independent **claim 34**, as filed.

Newly-presented dependent **claims 55-60** are similar to claims 43, 51, 44, 47, 49 and 53, respectively.

Newly-presented independent **claim 61** is somewhat similar to independent **claim 34**, as filed.

Newly-presented dependent **claims 63-67** are similar to claims 43, 51, 44, 47, 49 and 53, respectively.

Newly-presented independent **claim 68** is somewhat similar to independent **claim 34**, as filed.

Newly-presented dependent **claims 69 and 79** are supported, for example, in the specification at page 51, lines 9-12.

Newly-presented dependent **claims 71-76** are similar to claims 43, 51, 44, 47, 49 and 53, respectively.

Amendment of April 23, 1998

Support for the claims presented herein and amendments made herewith can be found, for example, in the specification at:

page 9, first paragraph
page 56, lines 4-7
page 60, lines 20-24 (not really)
page 66, lines 14-19
page 66, lines 20-25
page 67, lines 20-23
page 68, lines 14-17
page 85 (abstract), lines 7-11

CLAIM COUNT

The number of claims originally paid for (upon filing) is:

42 total claims (22 excess)
6 independent claims (3 excess)

There remain, after entry of this amendment:

35 total claims (15 excess)
4 independent claims (1 excess)

No excess claim fee is due upon entry of this amendment

CONCLUSION

No new matter is entered by this amendment

The claims should be allowed.

For the applicant,


Gerald E. Linden 30,282 April 23, 1998
(407) 382-7966 date